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Abstract

Cost effectiveness analysis is used in situations where benefits and costs are not readily converted into a money base. Five elements can be identified in such an analytic process: (1) The objective must be defined in terms of what it is and how it is attained; (2) alternatives to the objective must be clearly definable; (3) the costs must be expressed in a manner that makes sense in terms of the objective; (4) creation of a model provides the framework upon which one exercises judgment on the consequences of each alternative; (5) a criterion must be established so that the ranking of alternatives can be accomplished in desirable order. The process is designed to support judgment and intuition rather that to replace them. Related documents are EA 002 158 and EA 002 159. (LN)

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DEVELOPMENT OF AN OPERATIONAL MODEL FOR THE APPLICATION OF PLANNING-PROGRAMMING-BUDGETING SYSTEMS IN LOCAL SCHOOL DISTRICTS

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INTRODUCTION

Much is currently being written about the need to reform the budgeting practices of local school districts, and program budgeting is most often cited as the technique which will eventually be widely adopted. Proponents of program budgeting claim that its use can improve decision making concerning the rational allocation of scarce resources. To date, however, there is much uncertainty as to exactly how this modern management tool can most effectively be applied to a school district setting.

This is precisely the aim of a research activity currently being conducted by the Western New York School Study Council: to what extent, and how, can the techniques of program budgeting be adapted to the management of local school districts? Even among those who agree that program budgeting should be used by school districts, few are able to describe how this can be done.

During the course of this research activity, the Council will publish a series of Program Budgeting Notes. These Notes will keep the Council members informed of developments in program budgeting, both locally and nationwide. This publication is the third in that series of Notes.

COST-EFFECTIVENESS ANALYSIS: WHAT IS IT?

In recent years, the amount of money which has been made available for the support of public elementary and secondary education has increased dramatically. In western New York, for example, the median approved operating expense per WADA increased from $400 in 1957 to $623 in 1967, an increase of 55.8% in ten years (The Council, 1967, p. 7). On a state level, since 1958, the annual amount of state aid to education (in New York State) has increased from about $500 million to over $2 billion. Since the passage of the Elementary and Secondary Education Act in 1965, the federal government has made over $1 billion per year available to local school districts under Title I alone. This enormous infusion of dollars has made citizens and officials on local, state, and federal levels of government increasingly concerned about how the decisions to spend that money are made.

To date, educators often have reacted rather uncreatively and have spent the money in traditional ways, mainly on reductions in class size, addition of remedial specialists, and increases in teachers' salaries. "This very unimaginative route is taken despite the plethora of alternatives that are available: new instructional technologies, radically different curricula, and different types of teachers . . . (Levin, 1968, p. 3)." The concern over how to get the most impact out of this additional financial support has turned the attention of officials at all three levels of government to such techniques as cost-effectiveness analysis.

Levin (1968) suggests that over the last two decades our society has experienced a revolution in the decision making process. A whole new family of decision making tools has been created, and the most universally used techniques are those relating to cost-effectiveness analysis. Levin believes that this type of

analysis can lead to a more efficient allocation of school district resources.

Definitions

In the literature on decision making, one can easily become confused by the semantics of the new decision making technology. Fisher (1965) notes that several terms are used as though they were synonymous: systems analysis, cost-benefit analysis, and cost effectiveness analysis. To avoid confusion, it would be helpful to distinguish among these three terms. Quade (1965 and 1965a) distinguishes between cost-effectiveness analysis and systems analysis by referring to the scope of the problem under study. To Quade, systems analysis is more comprehensive. For example, if one were concerned with the problem of poverty, the decision as to which major approach to undertake would be a problem for systems analysis. If one of the major approaches turned out to be a job training program, the problem of deciding among job training programs "A," "B," and "C" would be subjected to either a cost-benefit or a cost-effectiveness analysis. Wildavasky (1966) distinguishes between cost-benefit and cost-effectiveness analysis on the basis of how it is possible to express the value of the outcome of the particular system under study. If the benefit to be derived from a particular system can be easily converted to dollars, a cost-benefit study is appropriate; where benefits cannot be readily converted to a dollar basis, a cost-effectiveness study is appropriate. The Bureau of Industrial Relations (BIR) of the University of Michigan concurs with Wildavasky's distinction. The Bureau (1969) applies the term cost-benefit analysis to situations in which the alternative outputs can be quantified in dollars. If the outputs cannot easily be quantified in dollars, the term cost-effectiveness analysis

applies.

What is Cost-Effectiveness Analysis?

There is not, unfortunately, anything magical in the cost-effectiveness process. Those who are perplexed by the complexity of contemporary problems will not find in it an automatic decision making tool which relieves them of the responsibility for making difficult and uncertain choices among competing courses of action. Quade (1965) notes that decision making was, and continues to be, an art. Before cost-effectiveness analysis, it was an art supported by ad hoc, seat-of-the-pants approaches and based on intuition and experience; now, it is based on analysis supported by intuition and experience. This is a subtle, but significant, distinction.

The issues that come before decision makers for resolution are exceedingly complex. This is true whether the decision maker is the Secretary of Defense or the superintendent of a school system. He alone carries the final administrative responsibility for deciding among competing and often highly controversial courses of action. The decision maker cannot possibly be familiar with all of the facts relevant to any particular decision. He must rely on the judgement of others. This is the context in which such techniques as cost-effectiveness analysis can aid the intuition and judgement of the decision maker.

> The method of cost-effectiveness analysis provides its answers by processes that are accessible to critical examination, capable of duplication by others, and, more or less, readily modified as new information becomes available . . . in contrast to other aids to decision making, which share the same limitations, it extracts everything possible from scientific methods, and its virtues are the virtues of those methods (Quade, 1965, p. 18).

The method not only communicates the decisions it generates, but it also lays bare the underlying assumptions upon which the decision is based. This process of communicating assumptions and methods of arriving at a particular decision focuses more directly on potential areas of disagreement, and pinpoints areas of uncertainty; and, in so doing, enhances the rationality of decision making.

There are five elements in the process of a cost-effectiveness analysis, and each element should be explicitly identified in every analysis.

1) The Objective. Cost-effectiveness analysis is undertaken to choose a course of action. The analyst must first determine what the objective of the decision maker is, and how to measure the attainment of the objective.

2) The Alternatives. These are the various common sense means by which the objective can be achieved. There should always be at least two alternatives -- without alternatives, there is no need for a decision maker.

3) The Costs. These must be expressed in a manner that makes sense in terms of the objective. For example, one of the costs of bombing a village in Vietnam to rid it of guerillas is the effect the bombing has in converting residents of that village to the cause of the guerillas.

4) Creation of a Model. This is a representation of the situation relevant to the question being studied. The means of representation can vary, but the model provides the framework for the exercise of judgement as to what the consequences of various alternatives will be.

5) A Criterion. This is a rule or a standard used to rank the alternatives in order of desirability so that the most promising one can be chosen.

This process is shown graphically in Figure 1 (Quade, 1965).

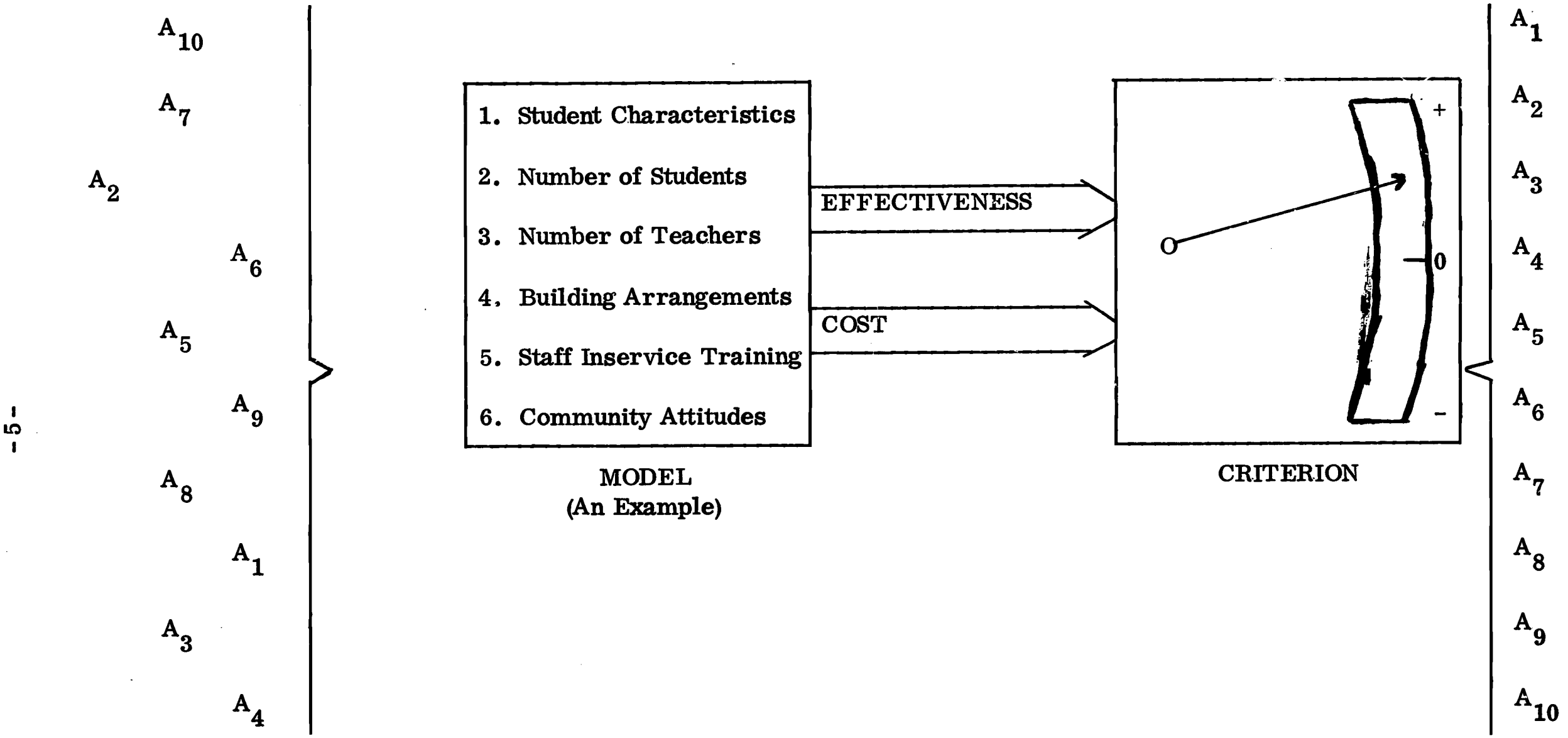

FIGURE 1

Structure of Cost-Effectiveness Analysis

The probable consequences of choosing any particular alternative (step 2) are obtained by means of the model (step 4). These consequences provide information about how effective each alternative is in achieving the objective (step 1) and what the costs of each alternative are (step 3). The criterion (step 5) is then used to decide among the alternatives.

Human judgement and intuition permeate the analysis. Both are used in designing the analysis, in choosing what alternatives to consider, in deciding what factors are relevant, what the interactions are, and what numerical values to choose. Finally, human judgement is used to interpret the results of the analysis itself. This is not a coldly objective, value free method of making decisions. Its processes are designed to support judgement and intuition, not to replace them.

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OTHER NOTES IN THIS SERIES

Number 1: "Introduction to Program Budgeting."

Reviews the history of governmental budgeting, traces the current interest in PPBS to the Defense Department, contains definitions of key terms in the PPBS lexicon, and focuses on some implications which PPBS has for education.

Number 2: "Program Budgeting in the Federal Government."

Examines the implementation of PPBS in the federal government with emphasis on Bureau of the Budget guidelines and specific questions about the resolution of important issues. Comments by executives of non-defense federal agencies are presented with a view toward deducing the applicability of PPBS to school districts.